periods, the Cretaceous floras being reserved for a second part. The numerous scattered references to the Mesozoic botany of the United States, and the conflicting opinions that have been expressed as to the geological age of the plant-bearing beds, enable us to thoroughly appreciate the value of a comprehensive report compiled by one who possesses a wide knowledge of palæobotanical literature. It is, however, not solely with published facts that the volume is concerned, for a large portion of it is devoted to a systematic account of recently discovered species. The Triassic floras are represented by fossils from the Connecticut Valley, Pennsylvania, Maryland, Virginia and other regions, while plants of Jurassic age are described from California, Oregon and Wyoming. One of the chief desiderata from the point of view of palæobotanical research is a careful and critical examination of the records of ancient floras, which may be of use in the consideration of the broad problems connected with plant evolution and distribution. In the treatment of work of this kind it is essential to carefully weed out such material as cannot be determined with sufficient accuracy to furnish trustworthy evidence. This obvious reflection is suggested by a perusal of the numerous determinations and descriptions contained in the volume before us. It is unfortunate that the plants from the Jurassic strata of California (the Oroville flora) are in most cases represented by fragmentary samples, and in several instances these have been referred to genera and species on evidence which cannot be accepted as satisfactory. Systematic work on fossil plants has too frequently been marred by a want of self-control on the part of authors who appear to be led away by a desire to attach names to specimens that are absolutely valueless as botanical records; we are compelled to add that the utility of the descriptive portions of this work is seriously impaired through lack of courage to discard worthless material. More than eighty specimens of cycadean stems are recorded from the Freezeout Hills of Wyoming—probably of Jurassic age. These stems are referred by Prof. Ward to a new genus, *Cycadella*, which is described as being characterised by the relatively small size of the trunks and by a dense covering of ramental tissue "exuberantly developed from the leaf-bases and extruded from the armour, massed and matted in the fossil state so as to form a thick outer covering." The exceptional development of the ramental scales suggests a comparison with the abundance of woolly hairs on the carpophylls of the recent cycadean genus *Dioon*, and constitutes an interesting feature which may serve as an index of climatal conditions.

The characters on which the cycadean stems are referred to distinct species are hardly such as to deserve specific recognition, and in looking over the numerous plates devoted to the specimens, one fails to appreciate the advantages gained by the reproduction of more than a hundred photographs, in most cases exhibiting only surface features which are often indistinctly shown and give little or no information of botanical value. Prof. Ward admits that the characters made use of in his classification are not the most satisfactory for diagnostic purposes, but we would urge that in the absence of more useful characteristics, such as might be obtained from an examination of the anatomy of the petrified stems, the application of specific names serves no useful purpose, but rather tends to confusion. Little information is given in regard to the reproductive organs; these are described as being less numerous than in other fossil cycads, but they appear to agree in position and in form with those of the *Bennettites* type.

There is no more striking feature of the Mesozoic vegetation of the United States than the extraordinary abundance of silicified cycadean stems, and no more valuable contribution could be made to our knowledge of extinct types than a comparative morphological account of the vegetative and reproductive organs of the American fossil cycadales. A foretaste of what may be expected has been supplied by Mr. Wieland, who has already published some descriptions of the reproductive organs of cycadean plants in the large collection at Newhaven; it is an extension of this kind of work that is urgently needed and for which there appears to be no lack of material.

Some pieces of coniferous wood are described by Mr. Knowlton and referred by him to *Araucarioxylon? obscurum*, n.sp., but in this case also the data are insufficient to justify the adoption of a distinctive specific name.

Apart from these criticisms as to the methods adopted in the systematic part of the work, we can cordially congratulate Prof. Ward on the completion of the first part of a research which must be of great value to students of palæobotany. A. C. S.

NOTES.

WE are glad to notice that the daily Press is endorsing what we have for years been endeavouring to bring home to the nation, viz. a better appreciation of the advantages of science and of scientific training. A notable instance of this is to be found in a leader in the *Times* of Monday last on the anniversary of Trafalgar, in the course of which our contemporary, in speaking of the recent naval disasters and breakdowns, says that these mishaps "suggest, if they do not indicate, some failure of competence, some lack of coordinating intelligence, among those who are responsible for the structural perfection of our warships. If this were so, it would tend to show that the national failing of which we have seen too many evidences of late, of neglect of scientific training, of the practical man's contempt for scientific method, of self-satisfied contentment with the traditional, the makeshift and the second best, is beginning to find its way into the constructive and engineering departments of the Admiralty." "We have heard much of late," remarks our contemporary, "about the need for 'standardising' our machines. Let us try if we cannot 'standardise' our educational methods and our intellectual equipment generally—not, indeed, according to the 'standards' of the Education Department, but according to the standard of the best that is known, and thought, and done in the world. In the Navy of to-day," says the *Times*, "there is zeal, capacity, energy and devotion in all respects worthy of the heroic past. The only thing that seems to be wanting is what is wanting in the nation, belief in knowledge and faith in applied intelligence." We trust that at this time, when we are being outstripped in many directions by foreign rivals, and commercial invasion has come to our very doors, and orders for machinery, railway locomotives, &c., are going in increasing numbers to our more energetic and receptive kinsmen across the sea, such words of warning as we have quoted will receive due attention and be acted upon ere it be too late.

THE question of fogs in London is at last, we are glad to see, to receive attention. The General Purposes Committee of the London County Council having had under consideration a letter from the secretary of the Meteorological Office, stating that it is proposed to hold an inquiry into the occurrence and distribution of fogs in the London district and their relation to other atmospheric and local conditions, and asking for the co-operation of the Council in the conduct of the inquiry, propose "(1) That a gentleman of suitable scientific qualifications be engaged by the Meteorological Council for a limited period, to formulate instructions and a scheme of observations, and to conduct the investigation; (2) that the observations be taken at the various Fire Brigade stations, and by men of the Fire Brigade; and also, if it can be so arranged, at other institutions of the London County Council; (3) that the returns be sent from the various stations, and from any other institutions selected, direct to the

Meteorological Office; (4) that the Meteorological Council do arrange with the police authorities for observations to be taken at selected positions outside the County of London; (5) that all responsibility as to the conduct of the investigation and any published results of such investigation do rest with the Meteorological Council; (6) that a copy of the complete returns and twelve copies of a report thereon by the Meteorological Council be supplied to the London County Council, and that the London County Council do contribute a sum of 250*l.* for the investigation." The steps about to be taken are most important, and should certainly lead to very valuable results.

THE second annual Huxley lecture of the Anthropological Institute will be delivered by Mr. Francis Galton, F.R.S., at the rooms of the Society of Arts, John Street, Adelphi, on the 29th inst., at 8.30 p.m. The subject chosen by the lecturer is "The Possible Improvement of the Human Breed under the Existing Conditions of Law and Sentiment." Tickets may be obtained on application at the Institute, 3, Hanover Square, W.

THE Frankland memorial lecture will be delivered before the Chemical Society by Prof. H. E. Armstrong, F.R.S., on Thursday next at 8.30 p.m.

THE opening meeting of the session of the Institution of Electrical Engineers for the presentation of premiums and the delivery of the presidential address will take place on Thursday, November 21, instead of on November 14 as was previously announced.

ARRANGEMENTS are being made for the next congress and exhibition of the Sanitary Institute to be held at Manchester in September, 1902. Earl Egerton of Tatton has accepted the presidentship, and the use of the Owens College buildings has been granted by the senate for the sectional meetings and as reception rooms. The exhibition will be held in the St. James's Hall.

THE eleventh Congress of Russian Naturalists and Medical Men will be held in St. Petersburg from January 2 to 12, 1902. There will be sections devoted to mathematics and mechanics, astronomy and geodesy, physics, physical geography, chemistry, geology and mineralogy, botany, zoology, anatomy and physiology, geography (with a subsection relating to statistics), medicine and hygiene, and agronomy.

THE next International Geographical Congress will be held in 1904 in Washington, under the auspices of the National Geographic Society, the president of the latter, Dr. Graham Bell, having just heard from Baron von Richthofen, president of the executive committee of the last Congress, of the acceptance of the invitation to Washington which had been tendered by the Society. In consequence of the decision of the executive, and in view of the coming Congress, the October issue of the *National Geographic Magazine* contains a brief account of the meetings of the Congress which have already taken place, and gives a list of possible excursions in America, each of which would be a geographical lesson.

THE new bacteriological department of the Royal Infirmary, Bristol, will be opened to-morrow by Sir Frederick Treves, K.C.V.O., who will afterwards distribute the prizes to the successful students in the Faculty of Medicine of University College, Bristol, and preside at the annual dinner of the Medical School.

PARIS was greatly excited on Saturday last when M. Santos Dumont, with his seventh balloon, successfully rounded the Eiffel Tower and returned to the shed at St. Cloud, thirty seconds within the thirty minutes allotted by the Committee of the Deutsch Prize. At the time of the voyage the wind, according to the *Times* correspondent, was blowing at the rate of twelve or thirteen miles an hour. At one period the balloon, travelling at the rate of thirty miles an hour, appeared as though it would collide with the Tower; the aëronaut, however, was able to control its movements without any apparent difficulty, and, as has been said, the journey was accomplished within the time limit agreed upon. M. Santos Dumont is to be congratulated upon the success which has at last attended the untiring efforts put forward by him towards the solution of the problem of aërial navigation.

THE death occurred last week, in his fifty-sixth year, of Dr. James Foulis, of Edinburgh. In 1872, at the suggestion of Prof. (now Sir William) Turner, he began to study the structure of the ovary and the development of the ova, more especially in reference to the then recently published work of Waldeyer. In 1874 the degree of M.D. and the gold medal for a thesis on this subject was conferred on him. The following year, having made many additional observations on the anatomy of the ovary, he contributed a paper to the Royal Society of Edinburgh on the development of the ova in man and other mammalia, which was published in the *Transactions* of the Society. Dr. Foulis published other papers, and in 1875 obtained the first award of the Prof. John Goodsir memorial prize for the encouragement of the study of anatomy and physiology.

WE regret to have to record the death of Canon Isaac Taylor, which took place on Friday last in his seventy-third year. Canon Taylor was the author of, among other works, "Words and Places," "Names and their Histories," "Etruscan Researches," "Greeks and Goths, a study in the Runes," and "The Alphabet, an account of the History and Development of Letters." He was one of the founders of the Alpine Club, and took great interest in gardening and entomology.

THE death is announced of Privy Councillor Maercker, professor of agricultural chemistry at the University of Halle.

AN interesting and valuable gift has just been made to the Ashmolean Natural History Society of Oxfordshire by Mr. Henry Willett, of Brighton, and consists of a piece of ground about five acres in extent, comprising woodland, marsh bog and water, which contains many local and rare specimens of animal and vegetable life. It is the wish of the donor that the land shall be known as "The Ruskin Plot," and that it shall be kept for all time in its natural condition. In order to ensure this a trust is being prepared which will vest the plot in the following trustees:—The Lord-Lieutenant of Oxfordshire, the Vice-Chancellor of the University, the Radcliffe Librarian, the Hope professor of zoology, the Sherardian professor of botany, and the donor. The ground in question is situated at Cothill, near Abingdon, Berks, and is meant more for observation than for collecting purposes. It is hoped that a systematic record, year by year, of a piece of ground untouched by cultivation will be of considerable interest.

AT this moment, when the metropolis is menaced by small-pox, the founding of a league which has for its objects the spread of a wider knowledge of the benefits derived from vaccination and a better understanding among the general public of the advantages arising from preventive medicine and practical sanitation, cannot but be deemed opportune. The Vaccination League has, we understand, the support of Mr. Jonathan Hutchinson, Sir Alfred Garrod, Prof. Charles Stewart and many other medical men.

A GREAT landslip has occurred in Barbados, of the extent, it is said, of 500 acres. The Boscobel district plantations and buildings have been wrecked, eighty-five houses have been swept into the sea, and 400 people are homeless. Roads have disappeared and all the landmarks are gone.

THE *Athenaeum* gives the following particulars respecting the new meteorological station which has just been established at Achariach, in Glen Nevis. The situation is such that a spur of Ben Nevis shuts in the valley to the west, and the height above sea-level is only 165 feet. The intention of the founder of the station—Mr. R. C. Mossman, of Edinburgh—is "to study the thermal conditions in the valley and on the adjacent hillsides during anticyclones in winter." It seems that in calm, cold weather and with a high barometer it not seldom happens that the mountain summits are much warmer than the valleys, which are filled with cold air chilled by radiation from the surrounding hills. The height to which this lake of cold air extends is to be the principal subject of investigation. The station is well equipped with a complete set of the best instruments.

IN addressing the Liverpool Chamber of Commerce on Monday last, Major Ronald Ross gave an encouraging account of the progress in sanitary matters which is taking place in West Africa. The governors of the coast were, he said, doing everything in their power for the great cause of sanitation, and their efforts were supported by the Colonial Office, but this sudden and delightful reform was due principally to the action of the Liverpool School of Tropical Medicine. He was still convinced that for practical purposes as a rule drainage was the proper way of dealing with malaria in large towns. In spite of letters in the papers, the fact that mosquitoes carried malaria was an absolute one. They did not propose to destroy every mosquito throughout the continent of Africa, but to reduce them in towns by getting rid of the innumerable breeding places. From six years' special study of mosquitoes he assured them that this measure would have the desired effect. Apart from malaria they proposed to do everything in their power to improve the health of the West Coast in every way. Already they had opened with the British Bank of West Africa a tropical sanitation fund, and they would begin a campaign in Nigeria when they were able to open an account for that work. In his opinion the West Coast of Africa was not so unhealthy as it had been painted by some, and his own experience proved that those who lived carefully there would most likely succeed in avoiding severe diseases. The country was opening up every day, and as it opened up so would disease tend to diminish, as it did in India and Burma before the advance of civilisation.

THE Nordenskjöld South Polar Expedition left Gothenburg on the 16th inst. on board the *Antarctic*.

DR. D. MORRIS, the Imperial Commissioner o. Agriculture for the West Indies, who has been in London for the past few weeks, has now returned to Barbados.

At the recently held annual meeting of the Royal College of Surgeons, Edinburgh, the following prizes were awarded :—The Victoria Jubilee Lister prize of the value of 100*l.*, founded by the late Dr. R. H. Gunning "for the greatest benefit done to practical surgery by any Fellow or Licentiate of the College during the quadrennial period ending June 20, 1901," to F. Mitchell Caird, of Edinburgh; the Surgical Essay prize of 100 guineas, offered by the College for "an original unpublished essay on surgery, in any of its branches on anatomy, physiology, therapeutics, or pathology, in their relations to surgery," to J. Veitch Paterson, of Edinburgh, the title of whose essay was "The Lymph Flow through the Eyeball."

THE Lecture List Calendar of the London Institution for the coming session is now ready, and includes the following addresses :—"On the Senses and Intelligence of Animals," by Lord Avebury; "The Life Period of Mountains," by Prof. G. A. J. Cole; "Optical Properties of Diamonds and Rubies," by Prof. S. P. Thompson; "Nourishment and Protection of the Young of some Animals," by Prof. C. Stewart; "Photographic Study of Clouds," by Mr. A. W. Clayden; "Conveyance of Malaria by the Mosquito," by Dr. P. Manson; "Recent Work among the Mollusca," by Prof. G. B. Howes; "The Heart," by Dr. H. Power; "The Mammoth Cave of Kentucky," by Mr. F. Lambert; "The Development of the Human Brain as an Organ of Mind," by Dr. F. W. Mott; "Colour Vision," by Mr. G. J. Burch; "Protection by Shape and Colour in Amphibia and Reptiles," by Dr. H. F. Gadow; "Inert Gases of the Atmosphere," by Prof. W. Ramsay.

ACCORDING to the daily papers a new principle in wireless signalling has been discovered by Mr. A. Orling and Mr. T. Armstrong, who last Friday gave a demonstration of the system which they have worked out. So far as we know, no description of Messrs. Orling and Armstrong's method has as yet appeared in the technical Press, and the details given by the newspapers being somewhat scanty it is difficult to form any definite idea of the probable utility of the system. We gather that the inventors rely partly, if not entirely, on earth conduction, and that they have been successful in transmitting speech in this manner. By using relays buried in the earth the range of signalling has been increased up to two and a half miles overland, a distance which, it must be admitted, is insignificant compared with Mr. Marconi's results. The system is, however, said to offer great facilities for tuning and thus to avoid the interference of messages, an advantage which should be of great benefit to it. The inventors appear to have devoted most of their attention to working out a method of controlling torpedoes or submarine boats from the shore. It may be recollected that in 1899 an account of some experiments made by Messrs. Jamieson and Trotter with this object appeared in the technical papers. These inventors used Hertz waves acting on a coherer on board the torpedo; although at the time it was said that the apparatus worked without a hitch, we have not since heard of its development or practical adoption. Messrs. Orling and Armstrong are said to have successfully guided a torpedo at a distance of six miles from shore.

AN excerpt from the *Proceedings* of the Royal Geographical Society of Australasia (Queensland) contains an illustration of the recently instituted "Thomson Foundation Gold Medal" of the Society. The medal, which is the work of Wyon, is to be awarded annually, or at such times as the council may approve, to the author of the best original contribution to geographical literature, preferential consideration being given to the geography of Australasia, provided it be, in the opinion of the council, of sufficient merit. The subject of the competition for the award of 1902 is "The Pastoral Industry of Australia, Past, Present and Probable Future," and essays must reach the Society not later than June 15 next.

AT the meeting of the Institution of Mining and Metallurgy held on Thursday last, an interesting paper was read by Mr. C. J. Alford on "Gold Mining in Egypt," in the course o. which he said that the exposure of the crystalline rocks in which the ancient gold mines of Egypt were worked, and in which search for deposits of metalliferous minerals might be undertaken with prospects of success, commenced about Jebel Zeit, at the south end of the Gulf of Suez, and extended in varying width along the coast line of the Red Sea, with few and slight interruptions for 700 miles, until it joined the mountains of Abyssinia. At Um Rus the mountain chain of crystalline rocks was about 60 miles in width from east to west, whilst 100 miles south it decreases to about 30 miles; then, in latitude 22° N., the boundary line between Egypt and the Sudan, it extended from the coast westward for fully 200 miles, and, with occasional covers of sand, all the way to the Nile. During the last twelve months the work of exploring the country and the

ancient mines had been pushed on energetically. At Um Rus the exploration of one of the ancient gold mines was commenced last December, and so far the results had been decidedly encouraging. Speaking at the meeting at which Mr. Alford's paper was read, Lord Harris stated his willingness to undertake the responsibility that a gold medal, or whatever material object the council of the Institution might suggest, should be presented as a prize for the purpose they might think most useful.

ACCORDING to the *Electrician*, difficulty has for some time past been experienced in maintaining communication with the observatory on the Zugspitze mountain, 3000 metres high, on the Austrian frontier of Bavaria, throughout the year. Last September the Bavarian Postal Telegraph Administration put the matter into the hands of the Allgemeine Elektricitäts Gesellschaft, who have now solved the difficulty by establishing a wireless telegraph installation between the observatory and the post-office of Eibsee on the Slaby-Arco system. The difference in altitude between the summit of the mountain and the Eibsee post office is 2000 metres. In designing the apparatus such a wave-length was chosen, so that deflection from the surfaces of rocks, &c., on the mountain should assist rather than impede the transmission of the signals. Another difficulty which has been overcome is that of the power supplied to the apparatus. The transport of heavy batteries, &c., to the top of the mountain would have been extremely difficult, and therefore the company has designed the apparatus so that it should require a minimum of power, and the dry cells which are employed with it have proved sufficient. Instead of the wire which has been used in many recent Slaby-Arco experiments, ordinary steel rope has been employed, and this has been fixed in a slanting direction to the surface of the rocks without the assistance of either a mast or insulators. It is stated that the system has so far given entire satisfaction to the Post Office authorities.

AT the Trinidad Agricultural Exhibition specimens of sponges which had been collected on the beach of Tobago were on show. The sponges were not large, but were soft in texture, minutely porous, and the presence of large silicious spicules, so common in inferior kinds, was not apparent. They resembled very much what are sold as face sponges. In the specimens exhibited it was seen that the structure was tender and easily pulled to pieces, showing that they would not last long in use. It was explained, however, that the specimens were taken from the beach, and there was nothing to show how long they had been exposed to the rolling of the breakers, the heat of the sun, and the erosion of sand and pebbles of the beach, which would naturally tend to rot the texture of a sponge. Such, however, is the quality that it is thought, says the *Bulletin of Miscellaneous Information* (Trinidad), a trial might usefully be made by a skilled diver on the reefs where they are produced, to ascertain whether the quality would be of fair market value, if harvested direct from their habitat. Such an experiment would cost but little, and, if successful, would confer a blessing on the little Island of Tobago, so long hampered by financial difficulties. In the Bahamas the export for 1898 was valued at 97,512*l*. If the reefs of Tobago should prove as fertile of marketable sponges as those of the Bahamas, it would mean the establishment of a new and permanent industry of the highest value.

THE Essex County Council is to be congratulated on the good work done in the technical laboratory at Chelmsford by Messrs. Dymond and Hughes. The "Notes on Agricultural Analyses" just issued contain a careful account of different descriptions of soil occurring in Essex, their geological and physical characteristics, and their chemical composition. This is just the kind of work which county councils may carry out with great advantage.

THE annual report of the Connecticut Agricultural Experiment Station, just issued, furnishes a good example of the kind of work done at an American station. One half the volume consists of reports of the analyses of fertilisers, foods and other agricultural commodities; the other half deals with investigations, and discusses agricultural questions. One of the most interesting articles is on the kinds of trees most suitable for street avenues, and the diseases and accidents to which they are specially liable. Dr. T. B. Osborne continues his laborious researches upon the chemistry of vegetable proteids. A valuable bibliography of American work on plant diseases is supplied by Dr. Sturgis.

WE have received a copy of Sir Charles Todd's Report upon the Rainfall in South Australia and the Northern Territory during 1898. Monthly and yearly values are given for a large number of stations and show that, generally speaking, the small annual average over the northern districts is mostly made up of summer rains, while in the southern districts the winter rains are largely in excess. As wheat growing chiefly depends upon the latter conditions, the monthly tables are very valuable for agricultural purposes. The annual distribution is clearly shown in two maps which accompany the report.

MR. W. W. WAGSTAFFE, B.A., has printed an interesting little pamphlet on the climate and weather of Sevenoaks, based on observations for ten years (1890-99). The absolute maximum temperature was 89° in August 1893, and the lowest 5° in February of the severe winter 1894–5. The average annual rainfall is 29·75 inches, of which only about one-third fell during the daytime. The summer temperature is nearly 3° lower than London.

THE first volume of the *Journal of Hygiene* has just been completed by the issue of part iv., which maintains the high standard of its predecessors. In it Rogers discusses the seasonal prevalence of *Anopheles* and malarial fever in Bengal, and his observations support the view that the disease known as Kala-azar of Assam, the ætiology of which has been doubtful, is an epidemic malarial fever and is transmitted by *Anopheles*. Nuttall and Shipley conclude their studies on the structure and biology of *Anopheles*, their paper being illustrated by some excellent plates. Cobbett surveys the epidemiology and bacteriology of a recent outbreak of diphtheria at Cambridge, and Fulton that of the Elkton (Maryland) milk epidemic of typhoid fever. The use of "neutral red" as a test for the colon bacillus and of its presence in waters is the subject of the remaining two papers by Makgill and by Savage These two investigators, working independently and separately, arrive at practically the same conclusions. They find that this reagent is a very delicate indicator for the colon bacillus and that a negative neutral-red reaction obtained with a sample of a water is high presumptive evidence of the absence of this organism.

THE current number of the *Berichte* of the German Chemical Society is remarkable for the number of original communications it contains, there being no less than 106, occupying 753 pages. Among these is a paper by Dr. Otto Ruff, on the existence of ammonium. It has been regarded as highly probable by many experimenters that on treating ammonium chloride solution with sodium amalgam or on electrolysing a solution of ammonium chloride with mercury as kathode, a real amalgam of ammonium with mercury is the true primary product. The problem is here attacked from a new and ingenious point of view, although with negative results. It is known that the alkali metals dissolve in liquid ammonia with the production of compounds possessing a fine blue colour. Thus a solution of potassium iodide in liquid ammonia submitted to electrolysis at a temperature of −70° C.

readily gives this blue compound at the negative pole. A solution of ammonium iodide in liquid ammonia was now substituted for the potassium salt, and then electrolysed at $-95°$ C., but no blue coloration was produced, hydrogen gas being steadily evolved from the commencement of the experiment. Thinking that perhaps an increase of pressure might have the desired effect the tube was sealed up, but although in one case the pressure rose to as much as 60 atmospheres before the tube burst, there was still not the slightest evidence of the existence of the radical ammonium in the free state.

THE same number of the *Berichte* contains an interesting paper, by H. Biltz, on the dissociation of the sulphur molecule. In recent years it has been shown by numerous researches that the maximum density of sulphur vapour corresponds to a molecule S_8 and not S_6 as usually represented in the text-books. But although this point is now well established, there was still a doubt as to the exact manner in which the molecule dissociated, the results of the first measurements of Biltz suggesting that the dissociation actually took place in two stages, the molecules S_8 first breaking up into S_6 and S_2, and these S_6 molecules finally splitting up into $3S_2$ molecules. In order to set this point at rest further measurements were carried out, the results of which are given in the present paper. The problem can be attacked in two ways; the densities can be determined at constant pressure, or at constant temperature with varying pressures. The latter method, giving isotherms, was selected as being capable of the greater accuracy, experiments being carried out at a temperature of 444° C. and at pressures between 14 and 540 mm. of mercury. The author concludes that only two kinds of sulphur molecules exist, S_8 and S_2, the former being the only ones present in sulphur solutions, the latter in sulphur gas at temperatures above 850° C.

A REPORT has been drawn up for the Franklin Institute on recent advances in the physics of water, by Dr. George Flowers Strading, and is published in the *Journal* of the Institute for October (pp. 257–269). It deals with the theory which assigns to water a complex molecular constitution, the maximum density and its dependence on the pressure, the relations between the pressure, volume and temperature, and the viscosity. In connection with the molecular constitution of water, the author discusses at some length Röntgen's theory, which regards water as consisting of two kinds of molecules called "ice molecules" and "molecules of the second kind." A subject somewhat allied to the above, namely the freezing points of solutions, was recently dealt with in the *Physical Review* by Messrs. E. H. Loomis and W. F. Magie.

THE *Mathematical Gazette* contains a brief account of the recent "Teaching of Mathematics" discussion by Mr. R. F. Muirhead, and a paper on the slide-rule by Prof. F. R. Barrell. We should like to see more matter of this kind in the pages of the *Gazette*, which, it may be remembered, is the organ of an association which till recently called itself the Association for the Improvement of Geometrical Teaching. The present is an opportune time for the Association to resume the functions expressed by its old title, and the fact that many of the members are engaged in teaching mathematics on conventional lines would add to the value of any opinions expressed in the *Gazette*.

IN a note contributed to the Lombardy *Rendiconti*, xxxiv. 16, Signor Alberto Dina compares the hysteresis in iron under a rotating, an alternating, and a statical magnetic field. In the first the magnitude of the inducing force remains constant and its direction varies, in the second and third the direction remains constant while the magnitude varies. The third case is distinguished from the first and second by the property that the complete cycle takes place much more slowly. The present experiments differ from those previously made in that the same body has been used in measuring each of the three kinds of hysteresis. The table of results shows clearly the behaviour of these different forms of hysteresis for equal induction; while the "alternating hysteresis" is always greater than the "statical hysteresis," the "rotatory hysteresis" lies between both of them until B = 10,000 units approximately; it then becomes equal to the statical, and afterwards less, and both the percentage difference and the absolute difference increase as the induction increases. These experiments were performed with iron of low permeability, and it is suggested that similar experiments with soft iron might yield interesting results.

IN addition to papers dealing with meteorological and physical subjects, Nos. 1 and 2 of the *Bulletin* of the Moscow Society of Naturalists for 1901 contain an important article by J. J. Gerassimow on the influence of the nucleus on the growth of the cell, and also one by Prof. D. Sernoff on the morphological nature of the tail-like appendages occasionally met with in the human race. After describing, with illustrations, several examples of these appendages, the latter author comes to the conclusion that they are teratological and in no sense atavistic.

IN the *Biologisches Centralblatt* for October, Dr. G. von Linden commences an account of his investigations into the structure of wings of insects, especially the Lepidoptera during the pupal stage, in relation to their origin and their bearing on the phylogeny of the different groups. The subject has been taken up where it was left by Schäfer, van Bemmelen, Haase, Urech and Eimer, and the theory of the latter that the original type of coloration in Lepidoptera was in the form of longitudinal stripes, while a uniform coloration is the final development, is confirmed. The bearing of the investigation on classification is left for a later communication.

IN the *Victorian Naturalist* for September Mr. W. Macgillivray concludes his notice of North Queensland birds, while Mr. R. Hall gives a further instalment of his notes on undescribed nests and eggs of Australian birds.

WE have received a copy of a paper by Miss N. Evans on the habits of the common grey mosquito of Calcutta (*Culex fatigans*), published in the August issue of the *Proceedings* of the Asiatic Society of Bengal. It is shown that the adult female may live for about five weeks, during which it may feed five times, when it selects by preference the blood of the house-sparrow. The latter fact suggests the possibility of this insect being a carrier of a definite blood-infection.

THE additions to the Zoological Society's Gardens during the past week include a Black-headed Lemur (*Lemur brunneus*), a Yellow-cheeked Lemur (*Lemur xanthomystax*) from Madagascar, presented by Mr. S. Neven Du Mont; two Arctic Wolves (*Canis occidentalis*) from New Mexico, presented by Mr. William Ruston; three Shaw's Gerbilles (*Gerbillus shawi*), a Dwarf Jerboa (*Dipodillus campestris*) from North Africa, presented by Mr. J. S. Whitaker; a Campbell's Monkey (*Cercopithecus campbelli*) from West Africa, two White-fronted Capuchins (*Cebus albifrons*) from South America, a Green-headed Tanager (*Calliste tricolor*) from South-east Brazil, two Dinca Finches (*Dinca grisea*) from Chili, a South Albemarle Tortoise (*Testudo vicina*) from the Galapagos Islands, a Rough Terrapin (*Nicoria punctularia*) from Northern South America, two Annulated Terrapins (*Nicoria annulata*) from Western South America, two Menobranchs (*Necturus maculatus*) from North America, two Dark Green Snakes (*Zamenis gemonensis*), a Four-lined Snake (*Coluber quatuorlineatus*), European; ten Snake Fishes (*Polypterus senegalus*) from the White Nile, East Africa, deposited; a Black-faced Spider Monkey (*Ateles ater*) from Eastern Peru, eight Golden Plovers (*Charadrius pluvialis*), European, purchased.